PalStudent Journal
A Palestinian Scientific Journal for the Youth

ABSTRACTS: VOLUME 7, SPECIAL ISSUE {7th Undergraduate Conference}

ABSTRACT

QUDS_ARS-III: A Novel Diagnostic Kit for Calcium Level Quantification in Human Serum

Bisan Katbeh, Razan Sa'd, Rawan Mali, Dania Radaydeh, Karam Zagharneh, Mohammad Qabajah

Al-Quds University

Background: Calcium plays a crucial role in various physiological processes within the human body, necessitating accurate and reliable methods for its quantification in clinical settings. Various techniques for measuring serum calcium are available, including the colorimetric method employing Arsenazo-III. This study aimed to develop a diagnostic assay utilizing Arsenazo-III for calcium quantification in human serum.

Methodology: The assay involved meticulous preparation of nine reagents under controlled ambient conditions with different criteria for the pH, buffer type and concentration. Each reagent underwent a thorough assessment for accuracy, precision, and stability. The experimental protocol involved the analysis of thirty measurements for each reagent, conducted twice daily over fifteen days. Data collected were entered into the MedLabQC quality control system. Performance evaluation was conducted using Westgard's rules and coefficient of variation, with stringent quality control measures applied to ensure consistency and reliability.

Results: Among the nine reagents evaluated, R6 demonstrated outstanding performance, exhibiting exceptional accuracy, precision, stability, and reliability. Its mean concentration is closely aligned with the control target values, with minimal variability and consistent adherence to quality control measures. Further evaluation of R6 revealed its sensitivity to calcium concentrations as low as 0.2 mg/dL and its specificity against magnesium ions, showcasing its potential for diagnostic use.

PalStudent Journal
Correspondence concerning this article should be addressed to the mentioned authors at the mentioned institutes.

E-mail: research@admin.alquds.edu
Palestine, Abu Dis, Al-Quds University

PalStudent Journal
A Palestinian Scientific Journal for the Youth

Conclusion: Developing a diagnostic assay utilizing Arsenazo-III for calcium quantification significantly advances clinical laboratory practices. R6 emerges as a promising candidate for diagnostic applications, offering both reliability and accuracy in clinical settings. Further validation studies and clinical trials are warranted to confirm its efficacy and utility in real-world applications, ultimately enhancing patient care and clinical outcomes.

Keywords: Calcium, Arsenazo-III, Diagnostic assay, Quality control, Accuracy, Precision, Stability.

Correspondence concerning this article should be addressed to the mentioned authors at the mentioned institutes.

E-mail: research@admin.alquds.edu
Palestine, Abu Dis, Al-Quds University